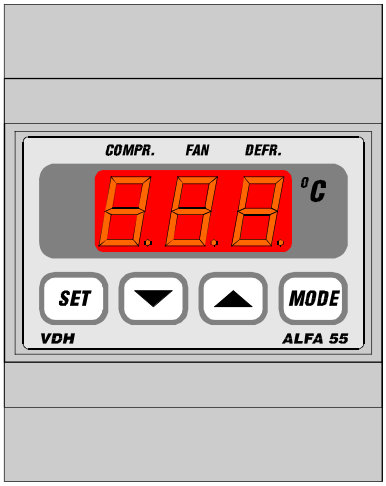
User manual ALFANET 55 -50/+150˚C

Cool/Defrost thermostat with fan-control and RS485.



VDH doc. 080704 **Version: v1.0** **Date: 23-05-2008**
Software: ALFA(NET) 55/75 **File: Do080704.WPD** **Range: -50/+150˚C per 1˚C**

* Description.

The **ALFANET 55** is a cool/defrost thermostat with various defrost-, and fan-control settings.
It is adjustable thru the **ALFANET PC-INTERFACE** on the PC.

* Installation.

On the connection diagram of the **ALFANET 55** is shown how the sensor, power supply and relays has to be connected.
After connecting the **ALFANET 55** to the power supply, a self test function is started. As this test is finished the measured temperature of the control-sensor appears in the display.

* Control.

The **ALFANET 55** thermostat can be controlled by four push buttons on the front. These keys are:

SET	- view / change the set point.
UP	- increase value.
DOWN	- decrease value.
MODE	- relay status key.

* View set point.

By pushing the **SET** key the set point appears in the display. The decimal point of the last display starts blinking to indicate this. After a few seconds after releasing the **SET** key the set point disappears and the measured temperature is shown again.

* Changing set point.

Push the **SET** key and the set point appears in the display. Release the **SET** key. Now push the **SET** key again together with the **UP** or **DOWN** keys to change the set point. After a few seconds after releasing the **SET** key the set point disappears and the measured temperature is shown again.

* Status of the Relays.

By pushing the **MODE** key, the display shows the status of the relays. Each display segment shows the status of the relay output, showing 0= off and 1=on. The code 110 means relay 1(compr.) en relay 2(fan) are on and relay 3(defr.) is off.

* Manual starting/stopping of defrost.

The defrost cycle is automatic started and stopped. These defrost settings thru internal parameters.

Stop defrost: If there is a defrost cycle , the defrost can be manually stopped by pushing the **UP** and the **DOWN** key simultaneously.

Start defrost: If there is no defrost cycle , the defrost can be manually started by pushing the **UP** and the **DOWN** key simultaneously.

* Setting internal parameters.

Next to the adjustment of the set point, some internal settings are possible like differentials, sensor-adjustments, set point-range, compressor-, fan-, defrost- and alarm-settings.
By pushing the **DOWN** key for more than 10 seconds, you enter the 'internal programming menu'.
In the left display the upper and the lower segments are blinking. Over the **UP** and **DOWN** keys the required parameter can be selected (see table for the parameters).
If the required parameter is selected, the value can be read-out by pushing the **SET** key. Pushing the **UP** and **DOWN** keys allows you to change the value of this parameter.
If after 20 seconds no key is pushed, the **ALFANET 55** changes to it's normal operation mode.

* Sensor adjustment.

The **temperature-sensor** can be adjusted by using the Offset control sensor (parameter 05).
The **defrost-sensor** can be adjusted by using the Offset defrost sensor (parameter 07).
For read out of the defrost sensor on the display use parameter 06.
Indicates a sensor e.g. 2˚C too much, the according Sensor-offset parameter has to be decreased with 2˚C.

* Error messages.

In the display of the **ALFANET 55** the following error messages can appear:

LO	- Minimum alarm	Solution E1/E2:
HI	- Maximum alarm	- Check if sensor is connected correctly.
E1	- Control sensor failure	- Check sensor (1000Ω/25˚C).
E2	- Defrost sensor failure	- Replace sensor.
EEE	- Settings are lost.	Solution EEE:
		- Reprogram the settings.

-L- - In case of sensor short-circuit the display alternates between error-code **E..** and **-L-**, as indication for a short-circuit sensor.

-H- - In case of open-circuit sensor the display alternates between error-code **E..** and **-H-**, as indication for a open circuit sensor.

Reset Alarm. When a error-messages appears it can be reset by pushing the **SET** key. The function of this key depends on parameter P37.

* Alarm operation.

As a failure or alarm occurs an error message is shown in the display. The **ALFANET 55** remembers it's error message, although it is already solved. The error message is resettable with the **SET** key.
As if after pressing the **SET** key (=reset alarm) the alarm still is not solved than the **ALFANET 55** displays the temperature and the error message alternated, is the alarm solved, then the error message disappears and the temperature is displayed normally.

* Fan control.

The **ALFANET 55** has several parameters for fan control. Normally the fan is always active, accept for one of the following parameters is set to 1, the fan can be stopped:

Parameter 20 = 1 Fan switch differential active:

The fan is only active when the defrost temperature is “parameter 21" lower than the measured product temperature. *Fan on : Tdefr.<(Tcontrol-Tfandiff.(P21))* As there are no further conditions to switch the fan off.

Parameter 25,26 Fan on-delay after defrost:

The fan is switched off during defrost and to prevent blowing in hot air in the cabin after defrost and the dripping-off time (parameter 27), there are two conditions which can be set;

a: The fan is blocked until the defrost sensor measures a temperature lower than the temperature setting of parameter 25.

b: The fan is blocked until the defrost-delay-time of parameter 26 has stopped. Unless the defrost sensor has reached the temperature setting of parameter 25.

Parameter 22 = 1 Compressor off than Fan off:

The fan deactivates as the compressor deactivates, with a delay of "parameter 23" minutes. Provided that there are no other conditions to deactivates the fan.

* Defrost control.

The automatic defrost is started by the defrost cycle time (P30) and stopped by the maximum defrost time (P31) or sooner by reaching the maximum defrost temperature (P32).
Further has the **ALFANET 55** additional parameters to control defrost;

Parameter 24 Defrost mode:

The **ALFANET-55** has two defrost modes;

P24 = 0 While defrosting only the Fan activates. (Natural defrost).

P24 = 1 While defrosting the relay DEFR. activates. (Hotgas / Electrical defrost).

Parameter 34 = 0 : Defrost at fixed interval time.

In this case parameter 30 is the chosen interval time.

Parameter 34 = 1 : Defrost based on total Compressor-time.

In this case the Defrost is started as the Compressor has been activated for “parameter 30" hours.

Parameter 36 = 1 : The **ALFANET 55** starts with Defrost on Power-up.

After Power-up the **ALFANET 55** first starts with a delay of “parameter 37" minutes before starting Defrost, while in delay the **ALFANET 55** works normally.

Parameter 33 = 1 : Compressor active at Defrost. (P24=1)

For hot-gas Defrost-systems the Compressor needs to be activated while defrosting. After Defrost the Drip-off -time (parameter 27) starts. During this time the defrost-relay and the compressor are not active so the Cool-unit can drip off.

* Parameters ALFANET 55.

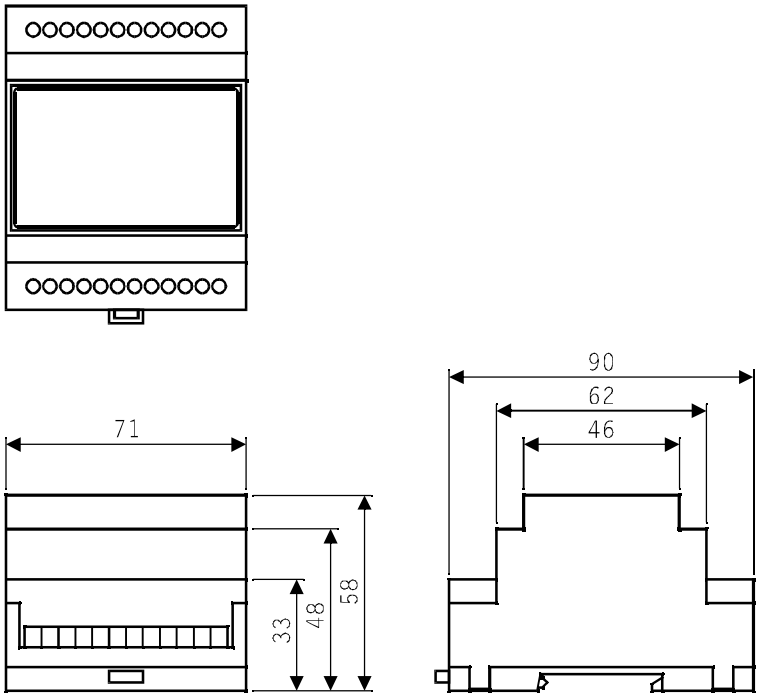
Para-meter	Description Parameter	Range	Default Value
01	Switching differential	1..15˚C	1
02	Minimum set point	-50..+150˚C	-50
03	Maximum set point	-50..+150˚C	+150
04	Read out above -10˚C per 1˚C	0=No, 1=Yes	0
05	Offset Control-sensor	-15..+15˚C	0
06	Read out Defrost-sensor	-	-
07	Offset Defrost-sensor	-15..+15˚C	0
10	Start-up delay Cooling	0..99	0
11	Switch-off delay Cooling	0..99	0
12	Parameter 10/11 in Sec. or Min.	0=Sec. 1=Min.	0
13	Minimum on-time Cooling	0..99 Minutes	0
14	Minimum off-time Cooling	0..99 Minutes	0
20	Switching differential Fan active	0=No, 1=Yes	0
21	Switching differential Fan	0..+150˚C	2
22	Fan off as Compressor is off	0=No, 1=Yes	0
23	Switch-off delay Fan	0..99 Minutes	0
24	Defrost mode 0=only fan-relay, 1=only defrost-relay	0 = Natural 1 =	0
25	Switch-on delay-temp. fan after defrost	Hotgas/Elec.	2
26	Switch-on delay-time fan after defrost	-50..+150˚C	0
27	Dripoff-time	0..99 Minutes 0..99 Minutes	0
30	Defrost-interval-time	1..99 Hours	12
31	Maximum defrost-time	0..99 Minutes	15
32	End of defrost temperature	-50..+150˚C	2
33	Compressor on while defrosting	0=No, 1=Yes	0
34	Defrosting on compressor-time	0=No, 1=Yes	0
35	Temperature display locked during defrost cycle	0=No, 1=Yes	0
36	Start with defrost after power-up	0=No, 1=Yes	0
37	Defrost on-delay after power-up	0..99 Minutes	0
40	Alarm mode	0 = None, 1 = Absolute 2 = Relative	1
41	Minimum alarm set point	-50..+150˚C	-50
42	Maximum alarm set point	-50..+150˚C	+150
43	Time-delay maximum alarm	0..99 Minutes	0
44	Time-delay minimum alarm	0..99 Minutes	0
45	Control-delay after power failure	0..99 Minutes	0
46	Compressor on at control-sensor failure	0=No, 1=Yes	0
47	Compressor off at minimum alarm	0=No, 1=Yes	1
90	Network number	0..255	1
95	Software version	0..255	-
96	Production Year	00..99	-
97	Production Week	1..52	-
98	Serial number (x1000)	0..255	-
99	Serial number (units)	0..999	-

* Technical details.

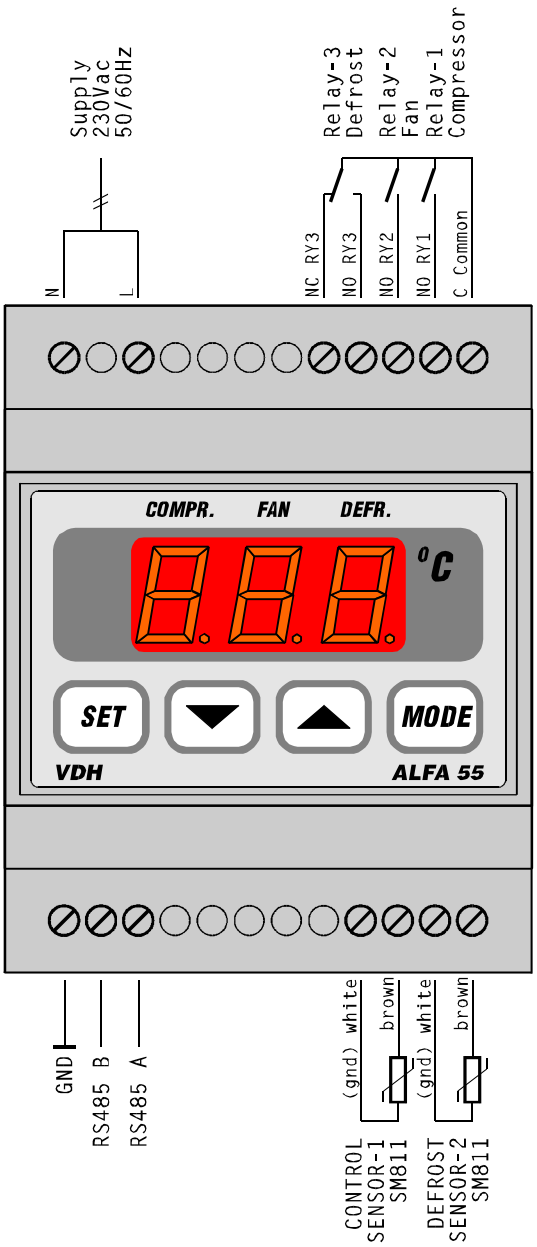
Type	: ALFANET 55 Cool/Defrost Thermostat	
Range	: -50/+150˚C, readout pro 1˚C	
Supply	: 230 Vac (or 24Vdc or 12Vdc see sticker)	
Relays	: The three relays have one common;	
	Ry-1 Compr.	SPST (NO) 250V/8A (cos φ=1)
	Ry-2 Fan	SPST (NO) 250V/8A (cos φ=1)
	Ry-3 Defrost	SPDT (NO,NC) 250V/8A (cos φ=1)
Control	: Thru pushbuttons on front.	
Front	: Polycarbonate IP65	
Sensors	: 2x SM 811/2m	(PTC 1000Ω/25˚C).
Network	: RS485 network (2-x twisted pair shielded cable min. 0,75mm^2)	
	Attention both network cable ends must be terminated with a 250 Ohm resistor	
	between Line-A and Line-B.	
Dimensions	: 90 x 71 x 58mm (HWD)	
Panel cutout	: 46 x 71mm (HW) at front mounting	
Accuracy	: ± 0,5% of range.	

- Provided with memory protection during power failure.
- Equipped with self-test function and sensor-failure detection.
- Connection with screw-terminals.
- Special version on request available.

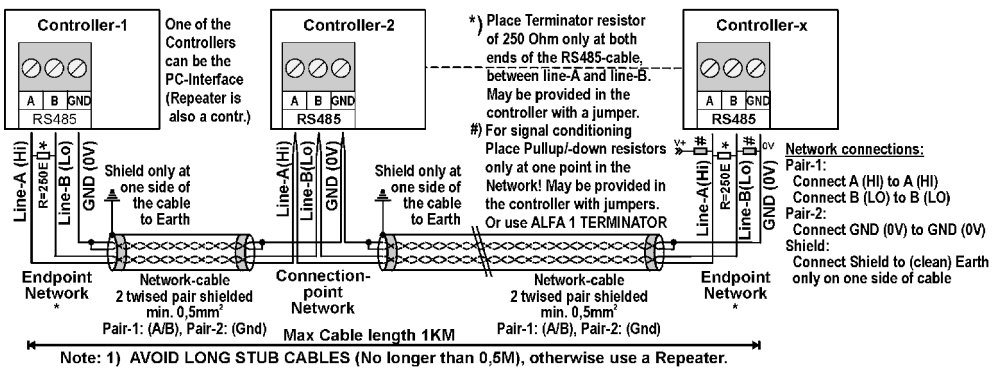
*** Dimensions.**



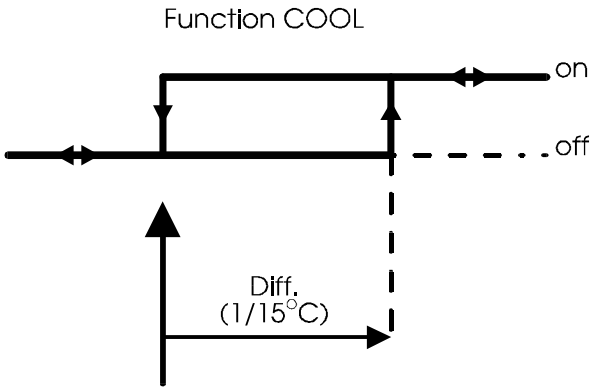
* Connections.



RS 485 NETWORK CONNECTIONS 2-twisted pair shielded cable:


Controller-1
A B GND
RS485
One of the Controllers can be the PC-Interface (Repeater is also a contr.)
Controller-2
A B GND
RS485
*) Place Terminator resistor of 250 Ohm only at both ends of the RS485-cable, between line-A and line-B. May be provided in the controller with a jumper.
#) For signal conditioning Place Pullup/-down resistors only at one point in the Network! May be provided in the controller with jumpers. Or use ALFA 1 TERMINATOR
Controller-x
A B GND
RS485
Line-A (Hi)
R=250E
Line-B (Lo)
GND (0V)
Shield only at one side of the cable to Earth
Endpoint Network
Network-cable 2 twised pair shielded min. 0,5mm²
Pair-1: (A/B), Pair-2: (Gnd)
Connection-point Network
Max Cable length 1KM
Network connections:
Pair-1:
Connect A (HI) to A (HI)
Connect B (LO) to B (LO)
Pair-2:
Connect GND (0V) to GND (0V)
Shield:
Connect Shield to (clean) Earth only on one side of cable
Note: 1) AVOID LONG STUB CABLES (No longer than 0,5M), otherwise use a Repeater.

* Function diagram.



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